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APPLIED BACTERIOLOGY

BY A BACTERIOLOGIST

I. IN DIPHTHERIA

THE prevention, treatment, and control of diphtheria depend almost entirely upon bacteriology and its applications. The antitoxin used to treat the disease is produced in the serum of a horse by the inoculation of toxin, which is a by-product of the growth of the diphtheria organisms. Toxin is also used in the Schick test.¹ Quarantine is based upon the presence of diphtheria bacilli in the throat. The doctor can in most cases diagnose a case of diphtheria by the clinical picture; notably, fever and membrane in the throat. He cannot, however, determine by the appearance of the throat the absence or presence of diphtheria bacilli, for the patient harbors diphtheria bacilli long after the throat has returned to a normal appearance. Hence release from quarantine depends upon bacteriological examinations showing no diphtheria bacilli. This is true except in the small per cent of cases that persist in harboring the organisms for a longer period than the maximum quarantine period required by law. The law varies in different states. The diphtheria quarantine regulation with which I am familiar is 21 days or two negative throat cultures taken after the ninth day of disease. Persons harboring the germs after the 21-day period are released from quarantine, but are isolated as carriers. Such carriers are active carriers. (They probably carry the organisms in hyperthrophied cryptic tonsils, which is true of most diphtheria carriers.) Besides the active carriers, we have the contact carriers. These persons have inhaled the bacilli when the patient has coughed or sneezed in their faces, but have not become ill, due to the fact that they are immune (have natural antitoxin in their blood), or are protected temporarily by a prophylactic dose of antitoxin.

So far, in this discussion, the term bacteriological findings has been used to designate a microscopic examination of a slide preparation made by smearing and staining some of the growth from the culture of the throat swabbings. A microscopic examination gives us only one means of identifying bacteria. It shows us their size, shape and staining characteristics. This is only one step in the classification of an organism. For example, not all the bacilli that look like diphtheria bacilli are capable of producing toxin, and consequently are not

¹ The Schick Test. Robert A. Kilduffe, M.D. *American Journal of Nursing*, Vol. XXII, No. 4, p. 254.

pathogenic. These diphtheria-like organisms are diphtheroids and are non-virulent and non-pathogenic.

Since many healthy persons harbor diphtheroids in their throat and only a small per cent are carriers of virulent bacilli, it becomes necessary to resort to a virulence test in order to pick out the individuals who are dangerous to their associates. It is well to remember that in taking swabs for culture from the throat of a carrier, the germs may be carried in the crypts of one tonsil, and not in the other; also, that diphtheria organisms are carried in the nose of both active and contact carriers. Diphtheria-like bacilli are sometimes the infecting organisms in otitis media. They are also found in wounds and in the vagina.

THE VIRULENCE TEST

Guinea pigs are used for the virulence test, as they are more susceptible to the toxin than are the other laboratory animals.

The diphtheria-like bacilli recovered from the throat are grown for 24-48 hours in broth or on a Loeffler's serum slant. The broth culture or a suspension in normal salt solution of the diphtheria bacilli from the Loeffler's slant is inoculated subcutaneously into the guinea pig. If toxins are produced by the bacilli, the guinea pig will die of toxemia in 12-72 hours. The autopsy of the guinea pig will show typical pathology which cannot be confused with other causes of death. One of the most striking lesions is the very red congested adrenals, which are normally creamy white. If no toxins are produced by the bacilli, the guinea pig will show no ill effects from the inoculation.

STUDENT GOVERNMENT

BY F. DUNNE

Student Nurse, Chicago, Ill.

OUR class entered Hahnemann Hospital Training School for Nurses in September, 1919. Discipline was based on the same plans as found in all training schools not having student government. One late leave was permitted a month and the request for the same had to be in the office not later than six o'clock. All social functions were proposed and given by the superintendent and supervisors and as a matter of fact we knew little about the activities of the school.

Our superintendent talked to us, following one of our class lectures, on student government. She read to us ideas from a training school having student government. The ideas were then discussed